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Citizens' Bulletin

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The Connecticut Department of Environmental Protection



General Putnam
rides on in
sculpture by
Anna Hyatt Huntington

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Citizens' Bulletin

June 1981

Volume 8 Number 10

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Garden clubs begin DEP internship program

The Federated Garden Clubs of Connecticut, Inc., has begun a program of internships in the Department of Environmental Protection for college students in conservation and environmental studies. From left, Jeanne Lena, president of the Federated Garden Clubs of Connecticut, and Sally Katkaveck, the group's conservation chairman, are shown presenting initial internship materials to DEP's George Russell, Director of Staff Services, and Steven Fish, Assistant Director of Information and Education for Education.

The first two internships, of \$500 each, will be awarded this spring and summer. The internships, which can be in any DEP unit, will attempt to take advantage of the students' areas of study and interests.

To be eligible a student must be at least entering his or her junior year. Students in graduate programs are also eligible. The number of internships available will vary as funds are made available by the membership of the Federated Garden Clubs of Connecticut.

The Federated Garden Clubs of Connecticut is a member of the National Council of State Garden Clubs. Its membership includes 181 local garden clubs around the State. Its purposes are the advancement of gardening and horticulture and the provision of assistance to local garden clubs. Funds for the newly established internship are donated by all of the 181 local clubs.

For additional information on internships, contact Steven Fish, DEP Information and Education Unit, State Office Building, Hartford, CT 06115.

Revised field guide

A revised, updated, and expanded edition of Complete Guide to Game Animals, A Field Book of North American Species, by Leonard Lee Rue III, has been released by Van Nostrand Reinhold Company's Outdoor Life Books. (The first, 1968 edition has gone through 12 printings and sold over 370,000 copies.)

"It is a book written for nature lovers as well as for the hunter," says Rue, "it is for anyone interested in wildlife." The over 600-page volume includes 44 species of mammals. Chapters on each animal cover description, distribution, habits, life spans,

field signs, enemies, trophy records, and edibility. Each chapter is illustrated with Rue's photographs.

Rue will personally autograph copies of the book purchased from him at R.D. #3, Box 31, Blairstown, NJ 07825. Cost is \$15.95 plus \$1.25 postage for a total of \$17.20.

"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities and employment opportunities without regard to race, color, religion, age, sex, physical handicap, national origin, ancestry, marital status or political beliefs."

This is the second of a series of three articles on members of the Huntington family and the saga memorialized by Connecticut's Collis P. Huntington State Park.

In her early thirties, tall, blue-eyed Anna Hyatt was a fairly successful but little-known sculptor specializing in animals. Then suddenly, thanks to a Tiffany executive's lifelong infatuation with Joan of Arc, Anna's genius won her international recognition, three decorations from France's Legion of Honor and ultimately marriage in 1923 to Archer Huntington, a famous art patron, scholar, conservationist, and philanthropist who was also one of America's richest millionaires.

If this were a typical Barbara Cartland yarn, the rest of Anna's life would consist of Fifth Avenue mansions with wine cellars kings might envy; dazzling dinners for high society, foreign notables, and famous relatives; travel to glamorous foreign lands; thousand-acre country hideaways with costly deerhounds for companions; and all the other trappings of wealth that Hollywood used to proclaim as the birthright of every clean-cut American girl. And that would be the end of the story.

But for Anna Hyatt Huntington, marriage wasn't the end of the story; it was the beginning of a better one. Not that she didn't have all the perks and privileges of vast wealth. She had them in spades, but they weren't important to her. In fact, she considered many of them nuisances.

What was important to her was her husband's unstinting encouragement of her tremendous creative drive, which kept her working on sculptures of ever-increasing size and difficulty until -- at the age of ninety-one -- she completed her thrilling, 65-ton bronze equestrian statue of revolutionary War General Israel Putnam, 50 percent larger than life.

The name of the statue is "Putnam's Escape at Horse Neck,"

Members of the Huntington family were more than patrons of the arts

By John Waters



Anna Hyatt was photographed by the Misses Selby of New York about 1914 - 1919. Courtesy of The Hispanic Society of America.

and it memorializes one of the few generals in history who have become famous for fleeing the enemy. The name "Horse Neck" is rather appropriate inasmuch as the statue shows General Putnam sitting more on his horse's neck than on its back as he rides the steed down the face of a cliff to avoid capture by English general Tryon's cavalrymen.

Donated Statue to Park

Anna Hyatt Huntington donated the statue of Putnam to Connecticut, and she was ninety-

three when it was unveiled in 1969 at the entrance to Israel Putnam Memorial State Park in Redding. After standing all through the hour-long ceremony, this remarkable woman then spent another 20 minutes signing autographs for her admirers.

Anna Hyatt was born in 1876 in Cambridge, Massachusetts, the daughter of the scientific director of the Boston Society of Natural History. It seems only natural that she would possess a keen interest in animals. As a child, she studied their anatomy and movements; as she grew older, she spent hours and days in the zoo, observing wild

animals of every kind at close range, often at considerable risk to herself. Horses especially fascinated her.

Anna's Animals

Her older sister was a sculptor, and Anna soon discovered her own interest in sculpture. She studied in Boston with the creator of "The Minute Man" statue at Lexington, Henry H. Kitson, and made rapid progress. Soon, Thomas Lawson, a famous Wall Street operator and copper magnate began to commission and buy her animal sculptures. Boston's upper-crust jewelers, Shreve, Crump & Low, also liked her animals and sold them to their Back Bay collectors. New York's Gorham Galleries also spotted her talent, bought her animal sculptures, and reproduced them for sale.

Anna moved to New York in 1903. She spent weeks studying and working at the Bronx Zoo. She also signed on as a student of Gutzon Borglum, who created the gigantic statues of Washington, Jefferson, Lincoln, and Teddy Roosevelt on the granite cliffs of Mount Rushmore in the Black Hills of South Dakota.

To Paris

France was the home of a school of sculptors known as "animaliers," who specialized in sculpturing animals. Since Anna was the only female animalier in the world, it is quite natural that she sailed for France in 1908 and started work on her first heroic subject: a life-sized Joan of Arc, sword in hand and clad in armor, riding into her first battle on a mighty Percheron stallion. Instead of making Joan a wild-eyed Amazon hunting down her prey, Anna portrayed her as a slender, inspired seventeen-year-old possessed of a combination of religious fervor and patriotism.

It was a daring undertaking for Anna. Statues of Joan of Arc were a sou a dozen in France, and all sculptured by men. That did not deter her. She worked 10-hour days every day for four months, building

Thrilling sculpture dramatizes wild ride

Israel Putnam, who had been the American general at Bunker Hill and who had catapulted himself into the books of famous quotations with his "Don't shoot until you see the whites of their eyes!" was encamped at Redding, Connecticut, in the winter of 1778. His job was to keep the British, who held New York City, from getting control of the Connecticut shore and to prevent their crossing Connecticut to take West Point and the Hudson.

Late in the winter, Putnam and 150 men with two cannons were reconnoitering around his outpost at Horse Neck (now Greenwich) when they encountered a much larger force of Redcoats. Hopelessly outnumbered, Putnam told his men to flee through the swamps, while he would attempt an end run back to Stamford to pick up reinforcements.

Move Over, Paul Revere!

Putnam took off on horseback with the enemy gaining on him. He knew of a cliff so steep that a hundred crude steps had been cut in it. It was the only way to shake the Redcoats off. Plunging down it, shaking his fist, and cussing his pursuers, he figured rightly that they would chicken out on following him. Frustrated, they fired at him, and one bullet knocked his hat off but did no



Rosemary Gutbrod photo

other damage to the general or his horse. General Tryon, who witnessed this amazing feat of horsemanship by the pot-bellied, 60-year-old veteran of many battles, was so impressed that he sent him a new hat!

Putnam reached Stamford, rounded up some militiamen, headed back to Greenwich, forced Tryon to retreat, and seized about 50 prisoners, some of them wounded. These he exchanged for American prisoners. This time, General Tryon was so touched by Putnam's magnanimity that he sent him a suit of clothes.

the large armature for the statue and applying the ton of clay the life-sized horse and rider required. Then she entered it in the 1910 annual show of the Paris Salon. The French judges, refusing to believe a woman could produce such a massive work without help from a man, passed it off with an Honorable Mention. And that would have been that -- except for one thing: France's five-hundredth birthday, due in 1912.

Fame

To honor the occasion, New York had decided to present France with a statue of Joan of Arc, to be unveiled at Rheims Cathedral. A Tiffany executive, J. Sanford Saltus, headed a committee conducting a worldwide search to find the best-qualified sculptor for the project. Saltus, who was virtually a worshipper of Joan of Arc, had seen Anna's sculpture at the 1910 Paris Salon and felt that it mirrored Joan's spirit so perfectly that no other sculptor came close. Although artists of six nationalities were competing for the commission, Anna won and instantly became an important person. (By 1912, she was listed as one of twelve women earning \$50,000 or more a year.)

Anna immediately set out to improve on her first Joan, researching details of the armor with help from Metropolitan Museum specialists. Working from small to larger models, she gave her new Joan greater dignity and toned down the action a bit. Meanwhile, architects designed a pedestal that would include stones from the Rouen tower where Joan had been imprisoned.

Tragedy

In December, 1915, the completed masterpiece -- 25 percent larger than life -- was unveiled on Riverside Drive at Ninety-Third Street, New York City!

Why not at Rheims? That's another story, and the title of the story is "The War to Make the World Safe for Democracy." Germany's birthday present to



France had been a declaration of war on August 3, 1914. By the time Anna's statue was to have been unveiled at Rheims, World War I was going full blast, and the Germans had shelled Rheims Cathedral, leaving it a partial ruin. (Stone from the ruin is embedded in the pedestal on Riverside Drive, where the statue has long been a landmark.) The next time you are in New York, take a bus or drive up Riverside Drive to Ninety-Third Street and you'll see why the statue made Anna Hyatt famous.

Honors

Although the new Joan had ended up on Riverside Drive instead of in France, the French government honored Anna with its Purple Rosette for Artistic Merit and awarded Saltus the Cross of the Legion of Honor.

After the war, Saltus and Anna arranged to make a copy of the Riverside Joan and Anna went back to Europe in 1921 to see it unveiled in the Garden of the Bishops in Blois. The French government honored her again, this time by making her a Chevalier of the Legion of Honor. Still later, it made her an Officer of the Legion of Honor.

Life begins at Eighty

The Putnam statue was by no means the only heroic piece that Anna completed in her extreme old age. In 1955, when she was 80, the Batista government in Cuba asked her to create a patriotic sculpture about Cuba, for presentation to the United States. She started work on an 18-foot equestrian statue of José Martí, a Cuban patriot and martyr who had been assassinated in 1895 when he attempted to lead a rebellion against Spain because it refused to grant citizenship to its Cuban subjects. The statue catches the moment of anguish with Martí clasp his breast and his terrified horse rearing wildly.

Anna completed this work in November 1958, and the bronze foundry was scheduled to deliver the casting to its site in November 1959. (Cuba had put up



Anna Hyatt Huntington's statue of Joan of Arc, at Riverside Drive and 93rd Street in New York, wore canonization decorations when this photo was taken by Edward Hagaman Hall on May 19, 1920. Courtesy of The New York Historical Society, New York City.

\$100,000 for an impressive 19-foot pedestal to be erected at the entrance to New York's Central Park at West Fifty-Ninth Street and the Avenue of the Americas.)

Unfortunately for Anna, Castro had seized power in January 1959, and Batista had fled. Just as World War I postponed the unveiling of Joan of Arc in France, so Cuban turmoil delayed

the unveiling of the Martí statue, scheduled for January 1960. Pro-Castro and anti-Castro groups in New York fought each other and rioted to obtain from the Park Department exclusive rights to the use of the site.

As a result, Martí was not unveiled until May 1965. Although she was 89, unflappable Anna attended the ceremony and was thrilled to be standing next

to Martí's handsome grandson, the Hollywood star Cesar Romero. In 1970, she gleefully told a reporter that women in the audience had ooh'd and aah'd when they saw Romero standing next to her.

The Busy Years

The 33 years between the unveiling of her Joan of Arc at Blois and the beginning of the Jose Martí statue were a period of hard work and high creativity for Anna, but they also engulfed her in a whirl of unfamiliar experiences -- some wonderful, some onerous, some almost tragic.

Her creative output was tremendous and included her famous Abraham Lincoln on the Prairie, seen by 30,000,000 people at the New York World's Fair; a completely new Joan of Arc for New York's Cathedral of St. John the Divine; another for the California Palace of the Legion of Honor; two jaguars for New York's Metropolitan Museum; equestrian statues of El Cid for the Hispanic Museum in New York and for Seville, Spain; a dejected Don Quixote and weary Rosinante after their mad battle with the windmills; and a dramatic equestrian statue of Sybil Ludington, a 16-year-old of Carmel, New York, who rode 40 miles through the night to summon volunteers to fight 2,000 redcoats who had set fire to Danbury.

All these were in addition to dozens of large and small sculptures of alligators, bears, bisons, boars, buffaloes, bulls, camels, cats, cows, deer, dogs, donkeys, elephants, fawns, fishes, foxes, goats, horses, jaguars, kangaroos, lambs, lions, llamas, monkeys, panthers, pigs, rabbits, raccoons, rhinoceroses, seals, snakes, stags, tigers, turtles, wolves, and zebras; also cranes, fish hawks, geese, macaws, marabous, ostriches, peacocks, swans, and vultures; plus a few centaurs, winged horses, and sea monsters.

Another of her activities in this period was to create two commemorative medals for the Hispanic Society of America, which had been founded by Archer

Huntington, the adopted son of Collis P. Huntington, the railroad and shipping magnate. Archer, a widely respected scholar and authority on Hispanic civilization, also built the magnificent Hispanic Museum for the Society on Audubon Terrace, New York City, on land Audubon once owned. Anna had worked closely with him in plan-

ning a sculpture exhibition for the museum, and he had asked her to do some sculptures for its inner court. Then, to the astonishment of high society and the art world, they were quietly married on March 10, 1923, which happened to be the birthday of both.

Next month: "Anna and Archer."

Where you can see Anna's sculptures

In addition to those in Collis P. Huntington and Israel Putnam Memorial State Parks, Anna Hyatt Huntington's sculptures may be seen in several Connecticut cities and in some not-too-distant places in neighboring states.

CONNECTICUT

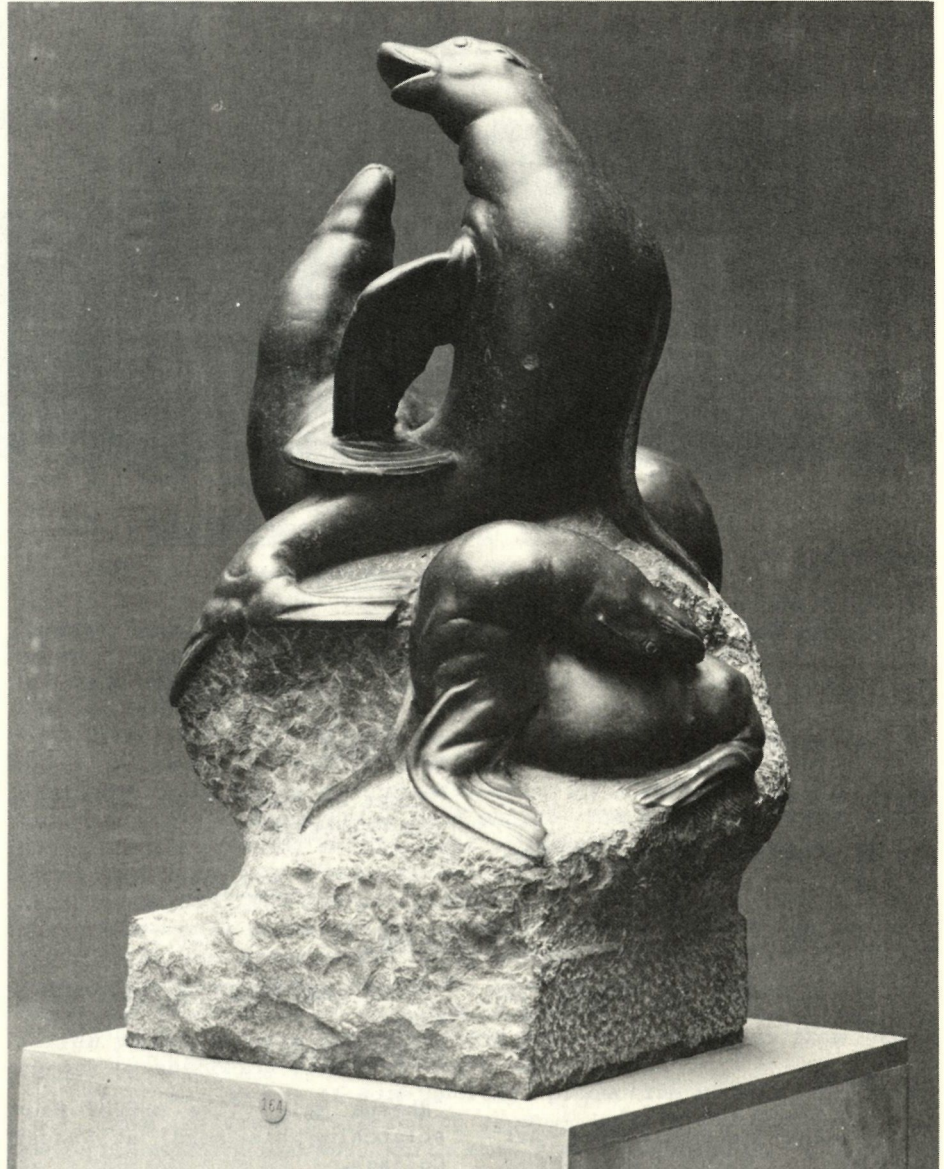
Bridgeport

"The Torch Bearers" in Museum of Science & Industry.

Danbury

"In Honor of Nurses" in Danbury Hospital.

"Charles Ives" in Scott-Fanton Museum.



Hartford

"Baby Centaur" and "Huey Cleaning Coat" in Wadsworth Atheneum. (Huey is a monkey.)

New Haven

Yale Gallery of Fine Arts.

New London

Lyman Allyn Museum.

Norwich

Slater Memorial Museum.

Redding

"A Tribute to the Work Horse" in John Read Middle School.

Torrington

Torrington Museum.

West Redding

Country Art Center.

MASSACHUSETTS

Boston

"Elephants Fighting" at Museum of Fine Arts.

Cambridge

"Diana of the Chase" and "Speedy" (a dog) at Fogg Art Museum.

Gloucester

"Young Diana" and "Joan of Arc" at Hammond Museum.

New Bedford

"Fisherman Memorial."

South Hadley

"Fawns Playing" at Mt. Holyoke College.

Springfield

"Goats Butting" at Museum of Fine Arts.

Worcester

"Two Swans" at Worcester Art Museum.



Courtesy of Slater Memorial Museum, Norwich.

RHODE ISLAND

Providence

"Angry Crane" at Museum of Rhode Island.

NEW JERSEY

Princeton

"Tiger Catching Heron" at Princeton University.

NEW YORK

Carmel

"Sybil Luddington" at Lake Glenside.

Poughkeepsie

"Rhesus Male" (the monkey Huey scratching his head) at Vassar College.

New York City

"Goats Butting," "Winter Noon," "Jaguar," "Tigers Hunting," "Reaching Jaguar," and "Yawning Tiger" at Metropolitan Museum of Art.

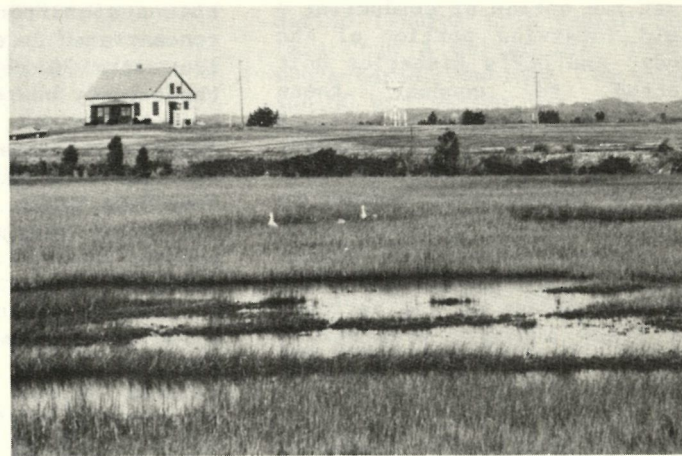
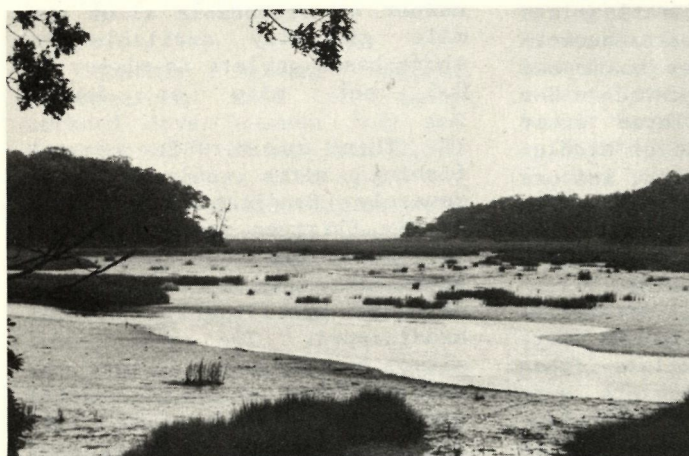
"Louis Agassiz" and "Henry P. Davison" at Hall of Fame.

"Joan of Arc" (relief) at Cathedral of St. John the Divine.

"Joan of Arc" (equestrian) at Riverside Drive and West Ninety-Third Street.

"Diana of the Chase" at New York Historical Society.

"Arabella Huntington" (Archer's mother) at Woodlawn Cemetery.
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Tidal marshes: Protecting our heritage

Although Connecticut has lost some 15,000 acres -- nearly 50 percent -- of its tidal wetlands since World War II, there are several stretches of marsh ringing our coast which remain healthy and serve a unique environmental function. Most of the destruction of wetlands came from filling operations before the value of such acreage was realized.

Tidal wetlands are said to be the most biologically productive areas on earth. An acre of tidal marsh produces twenty times the nutrients produced by an acre of wheat. As a result, marshes are an integral link in the aquatic food chain. The *Spartina* grasses which grow in typical marsh release vast amounts of nutrients when they decay each fall into the water column. Those nutrients support an array of marine life including shellfish, finfish, and crustaceans. Marshes are also nurseries for juvenile members of many species -- their calm, protected waters offer refuge from the predatory species roaming the open Sound. Likewise, you can usually find many aquatic birds and other forms of wildlife in marshes. Moreover, they help filter pollution from our waters and protect hinterlands from storm surges by absorbing flooding, angry tides.

These are photos of some healthy, productive marshes in Connecticut; they are areas protected by special laws in the State and across the country and well worth such special attention.

Survey looks at recreational marine fishing

Early in 1978 the National Marine Fisheries Service instituted a national marine recreational fishing survey through a contract with Human Sciences Research, Inc. (HRS). The survey was designed to estimate numbers of marine anglers, the composition of their catches, and related data for use in fisheries management nationwide. State agencies were given the option of conducting a field interview portion of the study, and DEP's Fisheries Unit elected to conduct these interviews as well as collect additional data via volunteer fishermen's logbooks, observations of recreational fishing in State Parks, and aerial flights to estimate levels of angler activity. A recently completed progress report on the national and State surveys, prepared by Robert F. Sampson, Jr., DEP Fisheries Biologist, offers a compendium of information on saltwater angling in Connecticut. This is the first of two articles excerpted from the report. Next month, "What they sought, and what they caught."

Where Connecticut's marine anglers fish

A total of 528 sites of all types -- natural beaches and banks; man-made structures such as docks, bridges, and jetties; private and rental (small) boat sites; and party and charter boats -- were identified along the Connecticut coast. Sites ranged in size from individual bridge crossings and public docks to large beaches such as Hammonasset and Sherwood Island State parks. While some sites include two or more types of fishing, only the principal one for a given location was considered in this study.

Aerial flights plus the character of many of the angling sites indicate that most marine fishing in Connecticut waters is done from vessels. Approximately 66 percent of all anglers observed between July and November 1979 fished from boats. Of the four types of fishing sites, private and rental boat launch sites are most prevalent. Known party boat and charter operations are concentrated in eastern Connecticut with 30 charter boats and three party boats located in New London County. Three other charters operate out of Middlesex, two from Fairfield, and one from New Haven counties. Two additional party boats are located in Fairfield County.

Boats and artificial structures appear to be more popular among anglers than natural sites. Anglers were encountered by field interviewers at a higher rate per day in private or rental boats and on man-made structures than on beaches or banks. Reasons for this may lie with patterns of coastal development as well as with factors such as availability of fish species. A second reason for the popularity of boats and man-made structures is that these are more productive. Man-made structures, particularly docks and jetties, furnish cover, currents, and backwater areas which tend to attract fish. Boats give the angler freedom to locate and follow moving schools of fish.

Coastal distribution of angling sites is equivalent to about 1.14 sites per coastal mile, if the 528 known sites are divided by 458 coastal miles. This figure is misleading since the actual number of sites per

mile, particularly for shore-based anglers, is considerably lower than one site per mile. According to the site list, 258 sites are primarily shore-based, for an average of 0.56 shore based sites per coastal mile. However, many of these sites are private or commercial properties rather than truly public sites. In such areas, a few anglers can often fish unhindered, but the number of acceptable sites per mile generally available to shore-based anglers is closer to 0.3 per mile or fewer.

There are very few coastal fishing sites suitable for severely handicapped persons. Of the thirteen sites found to be accessible to wheelchair-bound citizens, two appear to be designed specifically for the handicapped. The other eleven sites just happen to have the correct combination of parking and suitable surfaces to allow the handicapped access if they so desire. Low use of charter and party boats may be the result of unstable decks incompatible with the wheelchair or difficulties associated with initially boarding the vessel.

Connecticut has a small but viable charter and party boat industry. In addition to the known full-time operators, there is an indication that some people operate part-time charters which rely on informally solicited "neighborhood clientele." This latter group is impossible to identify as a component of the charter fleet but has been included within the private/rental boat sampling in this report.

Other than five State-owned parks, occasional town parks and docks and some privately owned

commercial sites, there are few formal fishing sites for anglers who do not own private boats. There are twenty-five major boat launch sites in the State, eleven of which are State owned. The most popular of these areas cannot handle peak demands for launching and mooring.

Who fishes Connecticut's coast?
How many anglers? How often?

The National Marine Fisheries Service survey estimated that 304,000 Connecticut resident marine anglers and an additional 78,000 non-residents fish Long Island Sound. The survey also concluded that resident anglers made approximately 1.39 million trips with non-residents contributing an additional 202,000 trips for an average of 4.2 trips per person.

Monthly midday aerial observations made on sunny weekend days between July and November 1979 found from 1,500 to 2,000 anglers fishing at any given time. These flights were designed to determine the areas most heavily utilized by anglers in order to avoid possible sampling errors.

The distribution of angler trips throughout the 1979-1980 fishing seasons was reflected in the average number of field intercept interviews conducted each month. Interview numbers ranged from 7.5 per day in March of 1980 to a seasonal high of 30.5 in August followed by a decline during the fall to a seasonal low of 0.6 during December.

As expected, peak fishing activity occurred during the vacation period (July and August). A smaller peak in April may be due to improved weather and the onset of the flounder fishing period. The subsequent decline in angler activity during May may be due to the opening of the freshwater fishing season in late April. A similar distribution of angler activity was observed in 1979 although rather than increasing sharply in August, effort remained relatively constant throughout the summer.

Coastal fishing in winter and early spring is limited mostly to the estuaries and bays. During January and February 1979, sampling was not conducted due to inclement weather and a virtual absence of angling activity. It is interesting to note that New London County anglers fish earlier in the spring than do their counterparts in the rest of the state. For example, 50 interviews were conducted in New London County during March 1979 as compared to 22 for the rest of the state despite the fact that 75 percent of the March sampling days were scheduled outside New London County.

Similarly, late fall and winter fishing is more prevalent in the eastern portion of the Sound with 31 interviews conducted in New London County during December and only one in Middlesex County. The tendency toward early spring fishing in eastern Long Island Sound may result from the area's relatively heavy winter fishery, which is most active in the estuaries of the Pawcatuck, Mystic, Thames and Niantic Rivers. Species responsible for these winter/early spring fisheries include striped bass, sea-run brown trout, tomcod, smelt, and white perch.

Angler interviews per assigned sampling day suggest that man-made waterside structures, private/rental boats, and party/charter boats are the most heavily utilized by Connecticut anglers. The results represent a slight underestimate because data was calculated only from anglers actually contacted, and occasionally some fishermen left sites while the interviewer was busy with other parties. This occurred most frequently at the private/rental boat sites. While sampling on man-made structures and private/rental boat areas, field interviewers encountered an average of 20 anglers per day compared to seven on the beaches and banks and an average of 24 on a selected sample of party/charter boats. Generally, man-made and beach or bank sites are fished year round, while private/rental and party/charter boats are used seasonally.

In general, low numbers of non-resident saltwater anglers fish Connecticut waters. They are most common in the western portion of Connecticut with New York and New Jersey anglers making up a large portion of the non-resident effort. Massachusetts fishermen tend to utilize the southeast shore. It appears that Connecticut anglers who reside 30 miles or more inland tend to fish in the southeastern region of Connecticut, largely due to the availability of free state launch facilities, shore based fishing sites, and a fleet of party, charter, and rental boats located in New London County.

What's it worth? Economic description of the fishery

The individual cost of each marine fishing trip ranged from less than a dollar for "local" shore-based outings to over \$66.00 per person for a charter boat trip. The average annual cost per trip for all modes combined is approximately \$8.27 and is roughly equivalent to a \$12.5 million annual expenditure. This figure includes daily trip costs such as bait, hooks, soda, beer, cigarettes, and lunch but does not include rods and reels, boats, or other "one time" purchases unless purchased on the day of the interview. Therefore, the actual capitalized value of the fishery is considerably higher than \$12 million when all external fishing costs are included.

Trip costs depend on fishing mode, species sought, time of year fished, and distance travelled to the fishing grounds. As one would expect, shore-based angling costs are lower than those for boat fishermen due to fuel costs and rental fees.

The cost per trip is typically highest early and late in the year. The increased trip expense for shore-based anglers during spring and fall may be linked to the species being sought since winter flounder, blackfish, and tomcod are actively pursued during spring

Eagles

By Thomas R. Hoehn,
DEP Wildlife Biologist

In 1977, an estimated 10,000 bald eagles existed in the lower 48 states, and they were considered in danger of becoming extinct. In 1979, the National Wildlife Federation began a nationwide mid-winter bald eagle count to monitor the plight of our national symbol. The count in 1979 was 9,689; in 1980 it was 13,127; the 1981 figures are not yet assembled.

The survey is new, not totally comprehensive, and more years of data will be needed before we can identify any trends, but it is clear that today we have only a fraction of the bald eagles that were present in 1940.

Connecticut bald eagle nesting records are very poor for the 1940s, but from the fragments of information available I would estimate that there were 12 pairs. In 1980, not one nest could be found. Compared to an estimated 70 pairs of breeding bald eagles in New York in 1940, only one pair nested in 1973 when the last native New York bald eagle fledged (reached flying age). In spite of their continuing annual nesting attempts, this pair is not expected to hatch any more young.

The reason for the continuing annual failures of the



In 1980 not one bald eagle nest could be found in Connecticut; however, in 1980-1981 more eagles have been counted in the State than in other recent years.

In 1782 the Continental Congress adopted the bald eagle as our national symbol. In 1977 the U.S. Department of the Interior declared it an endangered

species. The reduction of our national symbol to a creature on the list of endangered species clearly exemplifies how serious are our environmental concerns.

last remaining native bald eagle nest in New York is a familiar story. Egg shells collected from the nest in five separate unsuccessful hatching years during the 1970s measured an average of 26 percent thinner than the norm prior to 1946. The thin egg shells are breaking during the incubation period, and in some years, no eggs have been laid. Analysis of the contents of the failing eggs showed high levels of DDE (dichloro diphenyl dichloroethylene), the metabolite of the notorious DDT. It appears that the last pair of native New York bald eagles have a high degree of organochlorine (pesticide) contamination. It is very likely that thousands of eagles experienced the same fate throughout the United States.

Maine is now the only state in the Northeast with a substantial bald eagle breeding population. In 1980, observers located 56 pairs on their breeding territories, 29 pairs (52 percent) successfully raised 40 eaglets to fledgling age. An eagle population of 56 pairs producing 40 eaglets represents an average of .71 eaglets fledged per occupied nest. Most researchers estimate that productivity in bald eagle population must be more than 1.0 fledglings per pair annually for long-term stability. While the present eaglet per nest level is considerably less than that required for stability, there has been a slow improvement in recent years. In 1973 only .19 eaglets were fledged for each occupied nest in Maine. (This was the same year the reproduction rates for Connecticut osprey were at their poorest.) If the trend in Maine continues, their bald eagle population should reach a stable reproduction level in a few years.

Some researchers feel that segments of the bald eagle population have reached a level too low for adequate natural recovery. For this reason, the New York State Department of Environmental Conservation's Endangered Species Unit began a bald eagle restoration project in 1976. The project uses two

approaches: chick transfers to natural nesting sites and rearing of young eagles by hacking. Hacking is a falconer's term involving the raising of captive birds at a simulated nest site until they fly well and are able to find their own food. Both methods are dependent on a supply of eaglets which has come from captive eagles and wild nests in the states of Michigan, Wisconsin and Minnesota.

The chick transfers to the last natural New York nest have had limited success. Two of the four translocated chicks have fledged. All of the 22 eaglets reared by the hacking method have fledged. Dr. Thomas Cade of Cornell University, developer of the modern hacking technique, was contracted to oversee the hacking process. It involves around-the-clock surveillance of the eaglets with a remote control video camera to provide constant monitoring without human imprinting. Hacking station attendants act as parents, providing food and safety for young eaglets without being seen. It is a time consuming and expensive project but appears to be very successful.

Two eaglets released by the hacking method at Montezuma National Wildlife Refuge in western New York in 1976 nested 85 miles northeast of the release site in 1980. These birds, identified by wing tags attached when they fledged, hatched two chicks and fledged one young in their first nesting attempt. Thus a viable pair of bald eagles has been added to the single failing pair in New York State by using the hacking technique. New York officials are expanding their bald eagle restoration project, especially the hacking program; they plan to release 129 young bald eagles in the next five years. The goal is to reestablish 50 active pairs of bald eagles in New York.

In 1980-81, more eagles have been counted in Connecticut than in other recent years. A small group of dedicated volunteers has seen a few bald eagles in the spring and summer in

Northwestern Connecticut, but they have not located a nest. Connecticut's mid-winter bald eagle survey for 1981 located 26 bald eagles, 19 on the lower Connecticut River, the remaining seven in western Connecticut. It is impossible to determine a trend or status from the information collected in Connecticut so far, but we hope to improve this. It is possible that we have an active bald eagle nest in the State now.

The future for endangered species work in Connecticut is currently in question. Federal legislation has been passed to establish endangered species laws and limited funding, making it possible for states to receive reimbursement for work accomplished. These funds are contingent on several things:

1. The State must have a co-operative agreement with the U.S. Fish & Wildlife Service.
2. Appropriations must be released by the federal government and made available to the states.
3. State projects must meet federal guidelines, and a contract document must be signed to obligate funding reimbursement.
4. The states must have the personnel and must expend their own funds in order to obtain reimbursement for the programs.

A co-operative agreement has been signed with the U.S. Fish & Wildlife Service, which simply means Connecticut has the legal mechanisms to protect, manage, and enforce the parameters of the federal Endangered Species law. The federal appropriations, mentioned in item two above, are meager and uncertain from year to year. (As this article is being prepared, for example, we have learned that no federal funding will be available for fiscal year 1982 and that future expectations are dim.) The third issue, that of

"Little river of the Pequot" is setting for wide spectrum of environmental programs

By Jenny Mead,
Massachusetts Audubon Intern

A horde of youngsters, clutching collecting nets twice their size, descends on the beach. Unmindful of soggy sneakers or soaked shorts and shirts, they plunge into the water in an intent search for sea creatures. Excited shouts mark the first catch: a small blue crab which is dumped into a pail of water on the beach. The spirit of competition sets in; the others in the group wade farther into the water, dragging back nets filled with sand and seaweed. They are dumped on the beach, and crabs of all sizes attempt, unsuccessfully, to scuttle away.

Despite unwieldy nets — an observer has to be on guard against poles aimed unintentionally at the stomach — a certain gracefulness in the art of collecting marine life is obvious. The haul includes fish, crabs, clams, and mussels; one crab, missing a claw, looks particularly fearsome. It falls to the leader of the group, Bob Dewire, to do the dirty work. As the kids gather around, he gingerly picks up the creature and explains the mechanics of a crab's claw and how the crab will soon grow another.

After the crab and his fellow specimens have been handled and dicussed, they are returned to the water and the ten kids and Dewire pile into their van for the short drive back from Barn Island to the Denison PequotSepos Nature Center in Mystic.



Jenny Mead photos

The collecting trip is one feature of "The Week of the Gull," a marine program for nine to 12 year olds, run by center director Dewire. "The program is just to take a look at life in salt marshes, rocky shorelines, and beach areas," says Dewire. "It's an opportunity for the kids to see exactly what does live in these places. When they go to the beach in the future, hopefully they'll be able to recognize things from this experience." Held throughout the summer in alternate weeks because of changing tides, the program includes daily excursions to nearby coastal areas for a "hands-on" glimpse of coastal life.

"PequotSepos" means "little river of the Pequot" — the Indian tribe that once roamed southeastern Connecticut. Four tributaries of the Pequot flow through the nature center's 125-acre sanctuary; its four miles of trails include a trail for the blind with braille plaques and ropes to guide the hikers. Built in 1973, this is one of the first such trails in the State. Several ponds serve as classrooms for pond ecology courses, and the sanctuary encompasses fields, lowland wooded swamps, and open forests of oak and maple. A trailside interpretive building has classroom facilities, a museum store, natural history exhibits, and display cases of dragonflies, waterstriders, whirligig beetles, and other insects.



The center has a varied history. The land was originally a homestead given by grant in the 1600s to the local Denison family. In the early 1940s, the Mystic Garden Club was interested in developing a wildlife sanctuary. The Denison Society came to the rescue by leasing 125 acres, at a cost of one dollar per year, and the PequotSepos Wildlife Sanctuary, Inc., came into existence. A nature center operated out of a barn on the property until 1960, when the main building was constructed, housing the Connecticut Conservation Association, an environmental group. In 1972 the concentration shifted back to that of a nature center.

The center's director since 1976, Dewire runs many of its programs and field trips and publishes "The Chickadee," a monthly newsletter. With one other full-time and several part-time staff members, Dewire takes natural science and history courses to local schools. The sanctuary is the site for educational field trips such as "Introduction to Pond Ecology," "Spring Wildflowers," and "Bird Banding." A Saturday morning Explorer Program for six to eight year olds features workshops on making clouds, sundials, and sassafras tea.

Adults share in the fun and learning too; summer field trips cover identification of shorebirds, wildflowers, and butterflies. There are evening walks at Barn Island, pond life exploration forays, an annual April evening "Woodcock Walk" (bring your own flashlight) to observe the courtship flight of the male woodcock, and a springtime "in-depth look at the daffodil family" by an accredited judge for the American Daffodil Society.

A bird enthusiast, Dewire has a banding license and runs a Federal Bird Banding Station at the center, with demonstrations on catching and banding birds and opportunities for nature photographers to get close-up shots of various birds. Banding sessions for children "give them a chance to handle the birds and to see the whole operation from start to finish," says Dewire.

Birding is big in the area, and the center and the Connecticut Audubon council sponsor a Rare Bird Alert. Birders throughout the State call the center on Thursdays to report sightings of rare birds. Dewire con-

denses the reports into a two-and-a-half minute telephone tape providing information for bird-seekers both in and out-of-state. "It's a nice service in these gas-conscious times when people don't want to drive far away to find the birds. They just call the center," says Dewire.

Every bird-related project, he adds, attracts a lot of attention. "In the dead of winter, when it's 20 degrees, I'll go down to the shore for a scheduled bird field walk," says Dewire. "I'll be expecting just a few people, but I'll find 15 to 20 people there." The sanctuary itself — where 150 species of birds have been sighted — provides excellent bird-watching. The center also sponsors all-day shore bird migration trips to the Norwalk Islands; Fisher's Island, and walks at Napatree Point in Rhode Island.

Although the center does not have the facilities to be a full-fledged animal shelter, it does take in anywhere from 300 to 500 animals a year from the southeastern Connecticut/southern Rhode Island area. Badly injured animals are put to sleep; others are released when they are able to survive in the wild. A local vet lends his services, although the staff can generally handle broken wings, birds with concussions from flying into closed windows, and other relatively minor ailments. "We rarely get a glut of animals," says Dewire, "but it's really important that we take these animals in because there is no other shelter in the area."

Current residents: a docile boa constrictor who has been at the center for seven years, a red-shouldered hawk, a red-tailed hawk, and a barred owl whose blindness prevents him from being set free. Raccoons, possums, and skunks regularly pass through the center, and past inhabitants include a snowy owl, a red fox, and several deer. As for types of birds, Dewire says, "You name it, we've probably had at least one of them here at some point."

"Every day is an interesting experience here," says Dewire. The center reaches an average of 15,000 people a year, either as participants in the various programs or as visitors. Although many of the programs cater to the bird lovers in the area, the sanctuary and nearby coastal facilities are an excellent backdrop for a wide spectrum of programs touching many aspects of the environment. ■

Waste unit watches waters below landfills

By Harry Cooper, Senior Environmental Analyst, Solid Waste Management Unit

One of the State's most important resources, clean water, is increasingly threatened by discharges caused by man's activities. One of those activities, land disposal of solid and liquid wastes, has probably the greatest potential for causing long-term damage to our waters.

Until quite recently, state and federal environmental agencies most often dealt with the quality of surface waters -- lakes, rivers, ponds, wetlands, etc. -- but the quality of ground water has been receiving increasing attention. In the 1980 revisions to the State's Water Quality Standards, the water quality policies for surface waters were strengthened, and new ground water policies were developed, emphasizing the increasing importance being placed on ground water quality along with quality of surface waters.

Solid waste disposal at municipal and private landfills is regulated by the Solid Waste Management Unit of DEP, and this unit has made an effort over the past two years to develop a comprehensive water quality monitoring program. The major objective of this program is to protect the groundwater resource and users of that resource in the State. Ground and surface waters subject to possible contamination from refuse disposal areas throughout the State are monitored routinely to detect any changes.

Landfills pose a threat to ground water and surface water quality as a result of the absorptive qualities of the wastes disposed of and the ability of water to leach out

the various constituents of those wastes. Ground water which has come in contact with landfill leachate may no longer be suitable as drinking water because of aesthetic problems, and it may, in some instances, depending on the types of wastes disposed of, be a definite health hazard. In Connecticut where the annual rainfall averages 40 inches, leachate production in refuse disposal areas is unavoidable unless the wastes can be completely isolated from contact with water. While this is theoretically possible, in actual practice it is almost never achieved.



George Yarwood, left, and Jerry Davis preparing sample for lab analysis.

At the present time Connecticut has a total of 122 refuse disposal areas, plus another 40 sites which accept only bulky wastes. After extensive field investigations

and review of published information and of site data in DEP's files, all disposal areas were placed in categories based on their monitoring needs. Specific schedules were adopted for the sites within various categories to assure that each site is being monitored as often and as intensively as necessary; based on site characteristics, such as type of wastes, size of landfill, location, etc.

Monitoring of landfills is mainly done by using groundwater wells, usually ranging from one to four inches in diameter, which are strategically placed throughout landfill areas, with emphasis on the area directly downgradient of the actual disposal operation, since this is the area where leachate-contaminated ground water is most likely to be encountered. Landfill operators were asked to put in monitoring wells -- an average of four to five per site -- at about 60 locations where it appeared most likely that there might be leachate problems.

Samples of water are collected from these wells periodically throughout the year and are then analyzed for a number of organic and inorganic leachate indicators by the State Health Department Lab. In addition, samples are routinely analyzed with portable field equipment for indicators of leachate such as specific conductivity and ionic forms of iron, magnesium, chlorides, etc. One full-time DEP environmental analyst and two part-time employees spend a major part of their time on the monitoring program.

The specific goals of the landfill monitoring program are:

*Protection of ground water users (water supply wells)

*Protection of the ground water resource (aquifers)

*Collection of data to use as evidence in enforcement actions

*Demonstration of the presence or probable absence of leachate contamination

*Determination of the effectiveness of engineering designs and site pre-

parations (including liners, berms, subsurface diversion measures, etc.)

*Gathering of data to aid in developing design criteria

Over the last two years, in at least three towns in Connecticut, the results of the landfill water monitoring program have led to determinations that private wells were being affected by landfill contamination. In these instances, use of the wells had to be discontinued and alternate supplies of

water provided. Such protection of ground water user and ground water resource will continue to be primary objectives of the program.

The program works closely with DEP's Water Compliance Unit and Hazardous Waste Management Unit, and because of overlapping responsibilities investigations of suspected landfill-related well contamination are normally carried out as joint programs of the DEP Solid Waste and Water Compliance Units and the Department of Health Services. ■

The hydrologic cycle, leachate production, and monitoring wells

When rain falls on the land, some of the water runs off across the surface directly into streams, ponds, lakes, etc.; some evaporates back into the atmosphere; some is used by plants; and some sinks into the soil. The water that is evaporated from the surface is carried in the air until it condenses and falls again as rain. The soil moisture that is used by plants during their growing period is replaced by a portion of the rain water that enters the soil. This water is held there by capillary action.

The rest of the water that enters the soil moves downward until it reaches the water table. The water table is the top of the saturated zone, below which every pore in the soil or crack and hole in the bedrock is filled with water.

Once it reaches the water table, water is known as "ground water." Ground water flows just as surface water in a river does, only far more slowly. Ground water flow normally follows the contour of the land. While the flow of streams is measured in feet per second, ground water movement is usually measured in feet per month or year. Natural ground water quality depends on the types of soils and rock the water comes in contact with.

Ground water usually contains more dissolved minerals than does surface water, because

it is in contact with soils and rock much longer. Usually the longer the contact, the more dissolved minerals the ground water picks up. This is also why the quality of water from sand and gravel deposits is likely to be quite different from the quality of water from silt and clay deposits.

When ground water becomes contaminated by man's activities, the dissolved mineral content of the water increases greatly. Measuring the amount of dissolved minerals in ground water and comparing the levels to the background levels of natural ground water quality is one of the major methods of determining the degree of contamination.

In the case of a landfill, a portion of the water falling on the landfill will percolate downward through the refuse and eventually down to the water table to become part of the groundwater flow.

Solid waste is a mixture of organic and inorganic materials and living organisms. Even before the refuse is dumped at the landfill the microorganisms have begun to decompose the organic matter. This organic matter, decomposing under aerobic conditions, that is, in the presence of air, produces water and carbon dioxide which combines with the water leaching through the refuse to form carbonic acid. This acid, as well as other acids produced in the wastes, can act upon the inorganic materials in the refuse and the soils and rocks in the general area of the landfill.

During the vertical percolation of leaching water through the refuse, both organic decomposition products and inorganic leaching products as well as some microbes are picked up by the water and carried downward to the water table.

Most of the attenuation of leachate (removal of chemical and biological constituents of leachate by various chemical, physical, and biological means) is accomplished in the unsaturated zone between the refuse and the water table.

When the leachate, more or less attenuated, reaches the water table it becomes part of the ground water flow without however, substantially mixing with the other water. Instead, the contaminated portion of the ground water will travel as a plume, relatively undiluted, along with the ground water flow to an eventual point of discharge.

Monitoring wells located along the predicted boundaries of the leachate plume are used, at this stage, to insure that the leachate is moving as expected and not affecting other areas.

Schedules for sampling sites and the parameters selected are designed to provide meaningful data from which trends in water quality can be observed over a period of time. In this way, the total, long-term impact of a landfill can be measured as well as seasonal fluctuations which may or may not give an accurate picture of the overall effect. ■

Take note of the flowers that bloom on the trees on the street where you live

By G. Winston Carter

Illustrations by Pamela Carter

Riding to work early one April morning, I notice a misty reddish haze in the distance. The blossoming red maples are a welcome sight as they are one of the signals of the advent of spring. The maples remind me that the time has come for a parade of intriguing but inconspicuous flowers to burst forth on many of our common street trees. These blossoms may go unnoticed as they bloom so briefly and need to be observed quite closely for their beauty to be appreciated, unlike some of the more showy or flamboyant flowering trees which adorn our streets and lawns.

The splashes of red that appear on the red maple (*Acer rubrum*) on my lawn give me an opportunity to look more closely at the first of our beautiful maples to bloom. The buds have burst open, and flowers which may be scarlet or yellow appear before the leaves. They are arranged in pairs of opposite clusters, each on a long, thin stalk. The male and female are on separate clusters or may even be on separate trees. The stamens, either scarlet or yellow, usually vary from five to eight in number and are quite long. The female flowers have stamens which have either aborted or are quite short. Fertilization occurs rather rapidly, and small red wing-like seeds, characteristic of maples, soon appear.

Many people think that buds are first formed in the spring. What they are really seeing is the expanding and developing of the buds formed long before cold weather set in the previous season.

If the weather conditions are favorable, development can be fast because the leaves and flowers are perfectly formed inside the bud, waiting only for the right moment to burst forth.

Over the years, I have looked forward with anticipation to the moment when these tiny flowers appear. Making a regular loop around the neighborhood over a period of several weeks gives me an opportunity once again to examine each kind of flower, their composition and arrangement on the stem, and to wonder at the ways many of these common flowers differ one from the other.

One of the most commonly seen trees is the Norway maple (*Acer Platanoides*), a tree imported from Europe originally, which flowers fairly soon after the red maple. It can grow in nutrient poor soil and is more tolerant of air pollutants than native species. Horticulturists have developed many interesting forms of this hardy tree.

The flowers of the Norway maple are yellowish-green and they appear in erect, smooth, spherical clusters which are

tight at first and then almost seem to explode into more open, spray-like clusters. The male and female flower clusters are very similar, but in the male the pistil may be present, although it is only a rudiment. In the female flower cluster, the stamens may occur in the characteristic number but they never reach full length and pollen is not discharged because the anthers do not open. The pistil is the distinguishing feature of the flower, appearing in the central position. The leaves appear at about the same time as the flower clusters. The seeds that are formed as the result of the fertilization process are paired. They mature in September with wings widely spread.

The sugar maple (*Acer Saccharum*) may be seen in its flowering form in late April or May. The leaves and blossoms appear together, the flower clusters dangling downward, tassel-like. There is a five-lobed calyx but no petals. The two types of flowers, pistillate and staminate, may be borne in the same cluster or in separate clusters, or sometimes the two kinds are on different trees. If on the same tree, the seed-bearing tassels are at the tips of the twigs and those bearing pollen are along the side. While the staminate flower shows little or no trace of a pistil, the pistillate flower

possesses its complement of stamens, usually about eight, but these do not produce viable pollen. The mature seeds are not completely formed until autumn and resemble rabbit ears, the wings being quite close to each other.

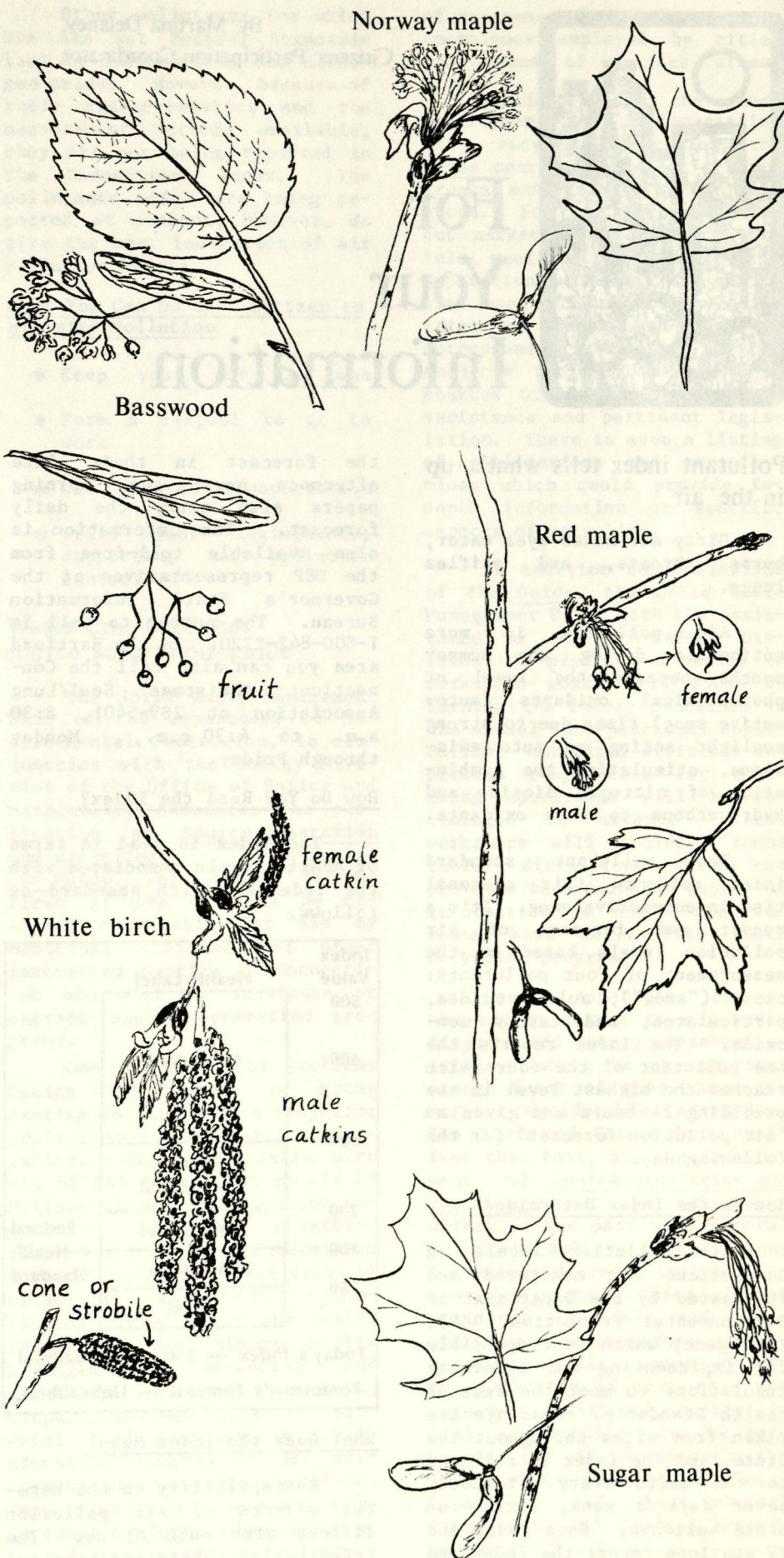
A somewhat different flowering tree is one of our well-known native birches which blossoms at about the same time as the sugar maple. Although the white birch (*Betula papyrifera*) is not found too often in this area as a native tree, it does seem to be quite common as an ornamental tree on many lawns. It is a beautiful example of a tree that has pendant tassels which are called catkins, apparently because of their imagined resemblance to a cat's tail. They are actually flower clusters as opposed to single flowers.

In most flowering plants, flowers are borne in groups or clusters. A cluster results from the branching of the main stem and is known as an inflorescence. There are different kinds of inflorescence such as raceme, spike, and catkin. Oaks, willows, and aspens are other examples of trees that have a catkin flower arrangement.

The beauty of the white birch lies both in the total impression of the tree which may have hundreds of male catkins dangling downward and in the male and female flower clusters themselves. The drooping male catkins are three to four inches long, slender, with reddish-brown scales. There is a single female catkin which is short, slender, and up to one-and-one-half inches in length and which curves upward above the male catkins. The flowers appear just before the leaves. Staminate catkins are in groups of two or three and start growing in the spring when they are about one inch in length, having wintered through in this form. The conelike fruits are about one-and-one-half inches long and hang downward producing small winged nutlets.

Another ornamental tree found on some lawns and parks is

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By Martina Delaney,
Citizens' Participation Coordinator

For Your Information

Pollutant index tells what's up in the air

Dirty air makes eyes water, burns throats, and stifles lungs.

Air pollution is more noticeable during the summer months because the level of photochemical oxidants (automotive smog) rises due to strong sunlight acting on auto emissions, stimulating the combination of nitrogen dioxide and hydrocarbons to form oxidants.

The pollutant standard index reflects this seasonal rise in automotive smog. It's a report and forecast of air pollution levels based on the measurement of four pollutants: ozone ("smog"), sulfur oxides, particulates, and carbon monoxide. The Index reports the one pollutant of the four which reached the highest level in the preceding 24 hours and gives an "air pollution forecast" for the following day.

How Is the Index Determined?

Air pollution levels in Connecticut are monitored and forecasted by the Department of Environmental Protection (DEP), the agency which is responsible for implementing and enforcing regulations to meet the Federal Health Standards. Readings are taken from sites throughout the State, and the index is released to the media every afternoon, seven days a week, except on State holidays. Some radio and TV stations report the Index and

the forecast in their late afternoon news; some morning papers also carry the daily forecast. The information is also available toll-free from the DEP representatives at the Governor's State Information Bureau. The number to call is 1-800-842-2220. In the Hartford area you can also call the Connecticut Christmas Seal/Lung Association at 289-5401, 8:30 a.m. to 4:30 p.m., Monday through Friday.

How Do You Read the Index?

The Index is read in terms of health levels associated with the federal health standard as follows:

Index Value	Health Label	
500		
400	Hazardous	
300		
200	Very Unhealthful	
100	Unhealthful	Federal
50	Moderate	← Health Standard
	Good	
Today's Index — 150 — Unhealthful		
Tomorrow's Forecast — Unhealthful		

What Does the Index Mean?

Susceptibility to the harmful effects of air pollution differs with each of us. The Index health labels indicate the

general effects of air pollution levels on: a) the healthy population; and b) those who are at "high risk."

Under high pollution conditions the healthy population experiences irritation of the eyes and respiratory system, decreased alertness, and greater breathing difficulties while exercising.

In general the Index labels can be interpreted as follows:

Good (0-50) - No significant effects of pollution.

Moderate (50-100) - Some damage to materials, but human health not affected unless such levels continue for many days.

Unhealthful (100-200) - High risk individuals experience mild aggravation of disease symptoms; those with lung or heart disease should reduce physical exertion and outdoor activity. Healthy individuals notice irritation.

Very Unhealthful (200-300) - Lung and heart disease patients experience significant aggravation of disease symptoms and decreased exercise tolerance. These individuals and the elderly should stay indoors and reduce physical activity. Widespread irritation symptoms in the healthy population.

Hazardous (300-500) - All people should remain indoors with windows and doors closed, minimize physical exertion, and avoid vehicular traffic.

What Are the Sources of These Pollutants & What Are Their Specific Health Effects?

While several pollutants are measured daily, the Index reports only the one pollutant which reaches the highest level each day. The following are those pollutants which are being monitored and reported:

Photochemical oxidants or "smog" will be reported most often during the summer months.

Ozone is the most common pollutant in "smog" and is used to determine "smog" levels. Smog is caused by the combination of auto emissions and the sun's rays. Levels are of concern when the sun is strong and the temperature high.

Smog irritates the eyes and throat, reduces defenses against infection, increases respiratory problems (such as asthma attacks), and is a contributing factor in the development of some chronic lung diseases. Of all the pollutants being reported smog is the most serious and widespread pollutant in Connecticut, affecting every area, both urban and rural.

Carbon monoxide (CO), another pollutant caused almost totally by the automobile, occurs at unhealthy levels only in localized areas in and near traffic. Carbon monoxide replaces oxygen in the blood stream. Because of the localized nature of this pollutant and measuring problems, CO will be the pollutant reported in the Index only rarely.

Sulfur oxides will be reported most often during the heating season. Sulfur oxides are caused primarily by the burning for heating and electricity of fuels containing sulfur.

Sulfur oxides irritate the upper respiratory tract and can damage lung tissue when combined with particulates. Sulfur oxides travel in the air and become sulfates. As of now there are no EPA standards for sulfates and these levels are not routinely reported.

Particulates are also reported more often during the heating season. They are caused by many types of industrial operations as well as by the burning of various types of fuels.

Particulates consist of solids and liquids such as dust, smoke, mists, and sprays. Particulates can irritate and damage the respiratory tract, especially when combined with sulfur oxides, smog, and nitrogen oxides.

Other pollutants for which EPA has set Federal Standards include hydrocarbons and nitrogen oxides. However, because of their characteristics and the measurement methods available, they are not being reported in the Connecticut Index. The pollutants which are being reported at present, however, do give the best indication of air pollution levels.

What You Can Do as a Citizen to Minimize Pollution

- * Keep your car in tune
- * Form a carpool to go to work
- * Use public transportation
- * Write your legislators, supporting air pollution controls.

Waste Unit publishes source separation guide

The Solid Waste Management Unit of the Department of Environmental Protection, in conjunction with the Energy Division of the Office of Policy and Management, announces the publication of Source Separation and Recycling: A Connecticut Guide. This manual is the first of its kind to be designed especially for use by municipal officials or other interested parties in Connecticut who wish to institute or upgrade source separation programs.

One of the major problems facing the person or group wanting to implement a recycling project is planning and organization. The Guide deals with all of the steps that should be followed in order to achieve the greatest success possible. These steps -- determining markets for the quantities of recyclable materials, establishing organization and administration, determining market arrangements, assessing and selecting collection methods, preparation and sale of material, and designing a public education program -- are discussed in separate sections. Case studies of selected Connecticut municipalities are also included, illustrating a variety

of management and implementation techniques employed by cities and towns of various sizes.

Besides covering the actual development and implementation of a recycling operation, the Guide contains a number of reference materials in the appendices. For instance, Connecticut markets for recycled materials, municipalities with source separation programs, and municipal used oil collection facilities are listed and shown on corresponding maps. Other subjects included are possible sources of labor and financial assistance and pertinent legislation. There is even a listing of publications and organizations which could provide in-depth information on specific aspects of recycling.

In addition to publication of the Guide, the Solid Waste Management Unit, with the assistance of the OPM-Energy Division, is planning a series of workshops which will focus on turning the theory contained in the manual into practical application. Municipal officials and persons responsible for recycling operations will be encouraged to attend. These workshops will include "round table" discussions which can prove to be a valuable source of information on how cities and towns have dealt with their recycling programs.

Source separation is not the entire answer to our waste disposal and energy conservation crisis, but it is an important enough facet of that answer to merit considerable attention. The State of Connecticut realizes this fact, and the development of Source Separation and Recycling and the subsequent workshops are part of a general effort to achieve a significant increase in recycling in the next few years. Chief elected municipal officials and recycling program operators will be receiving their copies of the Guide shortly if they have not already; additional copies in limited quantities can be purchased for \$2.00 through the Solid Waste Management Unit, Department of Environmental Protection, 165 Capitol Avenue, Hartford, CT 06115. ■

Remarkable Huntingtons

From page 8

"El Cid Campeador," "King Boabdil" (the last Moorish king of Granada), "Don Quixote," "Red Doe and Fawn," "Red Stag," "Wild Boars," "Lions," Museum of Hispanic Society.

"Camel Family," "Jaguar," "Reaching Jaguar" at Bronx Park Zoo.

North Salem

"Great Dane" at Hammond Museum. ■

Marine survey From page 11

and fall. These fish are most commonly caught with live bait, such as sand worms, which cost over two dollars per dozen. During summer months, re-usable artificial lures are frequently used to catch striped bass and bluefish. These outings generally cost about two dollars per trip.

Private rental boat fishing costs about \$9.00 per person, per outing. With an average party size of 2.3 persons, each boat represents approximately \$20.00 in trip expenses. In contrast to the cost trend exhibited by the shore-based fishery, boat-based costs per trip are lowest during spring and fall because these anglers seek flounder and blackfish in nearshore areas and, hence, use less fuel. During summer months, trips to offshore areas tend to increase fuel consumption and the resultant overall trip cost.

Compared to other fishing modes, the charter and headboat fisheries are the most costly, averaging \$23.00 and \$53.00 respectively. Moreover, non-residents who fish from charter and head boats frequently remain for meals or lodging after their trip which increases the average cost per trip.

The economic impact of recreational fisheries is far more extensive than the \$12.5 million in annual trip expenditures estimated in the national survey. The question asked of

anglers in the field was designed to obtain daily cost estimates and ignores external costs such as boat and motor purchase and auto gasoline which anglers expend in pursuing their sport.

The cost of a new boat, motor, and accessories may exceed \$10,000 at current market values. Boat buying and trading stimulates retail businesses as well as activity in lending institutions. Tackle shops and marinas get the benefits of trade in terminal gear, safety equipment, and repairs, while many hardware stores sell boat maintenance supplies. Spinoff sales for specialized clothing and related accessories such as coolers, cameras, and sport-fishery literature all add to the economy of the area.

Sales tax revenue from taxable trip expenses is estimated to exceed \$600,000 in addition to revenues associated with the sale of boats and motors used for marine fishing. Unfortunately, this latter figure is not available by any direct means. ■

Eagles From page 13

project substantiality and need, would be no problem for professional biologists to document. However, the final requirement, that the state must have the personnel and funding and make the expenditures before the reimbursement for 66 percent of the outlay can be made by the federal government, is the problem for Connecticut's future endangered species program. Constant funding, as opposed to periodic donations, coupled with the ability to maintain at least one full time biologist on staff to coordinate, document, and report department and volunteer efforts, is essential.

When and if we can establish an endangered species program in Connecticut, the bald eagle will be an important part of the program. When we can bolster the volunteer eagle workers with a professional position and necessary funding, we plan to try to help the bald eagle in a more dynamic manner. Until that time, we will con-

tinue to do our best, under the circumstances. ■

Flowering street trees

From page 19

the basswood (*Tilia americana*) which is a shade tree that seems to take its time blossoming and developing fruit. For a number of years I was puzzled because the basswood I was observing did not show signs of putting out new growth in the spring when all the other trees around it were blossoming and developing leaves in a rather rapid fashion. It seems I was never around at the right time of year to see the actual blossoming.

One day during the summer months, I was picnicking in a local park and noticed a tree with an unusual flower cluster and a very fragrant odor. On closer examination, to my delight I discovered that it was a basswood, which apparently blossoms in late June and July. This handsome blossom is pollinated by insects, particularly bees. The bees like the nectar so much that the tree is often called "bee tree." ■

The flowers are yellowish to white, borne in flat drooping clusters called cymes. A cyme is a type of inflorescence which is broad and more or less flat-topped, with the central flowers opening first. Each cluster contains about a dozen flowers with both the male and female parts. They are suspended at the end of a branch which emerges from the middle of a long leaf-like bract. The fruit that forms is woody and pea-sized and is attached singly or in groups on a wing. Sparse clusters remain on the trees into the winter.

These are just a few of the trees whose flowering often goes unnoticed, partially because the flowers might be mistaken for leaves at a distance or, in many instances, because people do not know just what to look for. Perhaps this may serve as the beginning of a new awareness for you of the beauty of flowering trees that are near at hand.

Public Hearings

June 16, 1981; 10 a.m.

Rm. 221, State Office Bldg.,
Hartford

To consider application of American Electro Products, Inc., to discharge to the Sanitary Sewer of the Town of Waterbury an average of 96,000 gallons per day and a maximum of 144,000 gallons per day of treated metal finishing wastewaters.

June 17, 1981; 1:30 p.m.

Rm. 221, State Office Bldg.,
Hartford

To consider application of Dr. Rose, Inc., to discharge to the ground through a leaching field in the Town of Madison 200 gallons per day of rinsewater from the manufacture of glycerine suppositories.

June 17, 1981; 10 a.m.

Rm. 221, State Office Bldg.,
Hartford

To consider the application of Paparazzo Management, Inc., of the Town of Woodbury, to discharge a maximum of 26,475 gallons per day of treated domestic sewage to the groundwaters of the Nonewaug River Watershed. Permit application is for construction of sewage collection system, septic tanks, dosing chamber, and leaching field for the treatment and disposal of domestic sewage.

June 23, 1981; 10 a.m.

Rm. 221, State Office Bldg.,
Hartford

To consider application of Robert Foshay of the Town of Stamford to discharge into the waters of the State of Connecticut.

June 25, 1981; 10 a.m.

Rm. 221, State Office Bldg.,
Hartford

To consider the application of Pitney Bowes, Inc., of the City of Stamford, to discharge 9,800 gallons per day of pretreated metal finishing wastewater to the City of Stamford sanitary sewerage system.

July 8, 1981; 10 a.m.

Rm. 221, State Office Bldg.,
Hartford

To consider application of The Ripley Company of the Town of Cromwell to discharge 2,000 gallons per day of non-contact cool-

ing water into the Connecticut River, and 100 gallons per day of tumbling and cleaning wastewater to the groundwaters in the Town of Cromwell.

Permits Issued

Water Compliance

10/28/80: Newmont Exploration Ltd., Danbury

To discharge to the Danbury sewerage system an average daily flow of 850 gallons per day of general laboratory wastewaters. Conditions.

10/28/80: State of Connecticut Department of Environmental Protection, (Hartford), Madison

To discharge to Long Island Sound an average daily flow of 110,000 gallons per day of wastewaters. Conditions.

10/28/80: Union Carbide Corp., Linde Division, Suffield

To discharge to the Town of Suffield sewage system an average daily flow of 200 gallons of vehicle wash water. Conditions.

10/28/80: Hartford Insurance Group, Bloomfield

To discharge to the Metropolitan District Commission sewerage system an average daily flow of 4,420 gallons per day of pretreated photographic and printing wastewaters. Conditions.

11/4/80: Mr. Rufus Barringer, Lyme

To discharge to the Connecticut River an average daily flow of 20,000 gallons per day of cooling and/or heating water at a maximum temperature of 65° F. Conditions.

11/4/80: WAM Realty, Plainfield

To discharge to the Quinnebaug River an average daily flow of 400 gallons per day of boiler blowdown wastewater at a maximum temperature of 212° F. Conditions.

11/4/80: C and M Corporation, Plainfield

To discharge to the Quinnebaug River an average daily flow of 40,000 gallons per day of cooling water at a maximum temperature of 90° F. Conditions.

11/4/80: H & S Torrington Associates, Torrington

To discharge to the City of Torrington sewerage system an average daily flow of 9,000 gallons per day of domestic sewage. Conditions.

11/17/80: State of Connecticut Department of Corrections, Somers

To discharge to Woods Stream an average daily flow of 250,000 gallons per day of wastewaters. Conditions.

11/17/80: State of Connecticut Department of Mental Retardation, Southbury

To discharge to Transylvania Brook an average daily flow of 300,000 gallons per day of wastewaters. Conditions.

11/17/80: University of Connecticut, Groton

To discharge to Pine Island Bay an average daily flow of 330,000 gallons per day of wastewaters. Conditions.

11/17/80: University of Connecticut, Mansfield

To discharge to the Willimantic River an average daily flow of 1,980,000 gallons per day of wastewaters. Conditions.

11/17/80: State of Connecticut Department of Mental Health, Newtown

To discharge to Deep Brook an average daily flow of 600,000 gallons per day of wastewaters. Conditions.

11/17/80: State of Connecticut Department of Mental Retardation, Mansfield

To discharge to the Willimantic River an average daily flow of 300,000 gallons per day of wastewaters. Conditions.

11/17/80: State of Connecticut Department of Mental Retardation, Waterford

To discharge to Long Island Sound an average daily flow of 60,000 gallons per day of wastewaters. Conditions.

11/17/80: State of Connecticut Department of Corrections, East Lyme

To discharge to Bride Brook an average daily flow of 80,000 gallons per day of wastewaters. Conditions.

11/17/80: State of Connecticut
Department of Mental Health,
Preston
To discharge to the Thames River
an average daily flow of 600,000
gallons per day of wastewaters.
Conditions.

11/17/80: State of Connecticut
Department of Mental Health,
Middletown
To discharge to the Connecticut
River an average daily flow of
750,000 gallons per day of waste-
waters. Conditions.

12/11/80: Tishman Stamford Asso-
ciates, Stamford
To discharge to the City of Stam-
ford sewerage system an average
daily flow of 49,160 gallons per
day of domestic sewage. Condi-
tions.

12/19/80: U.S. Chrome Corpora-
tion, Stratford
To discharge to the Town of Strat-
ford sewerage system an average
daily flow of 4,000 gallons per
day of metal cleaning wastewaters.
Conditions.

12/23/80: Danbury Savings and
Loan Association, Inc., and Suc-
cessor, Stony Hill Village Con-
dominium Association, Inc.,
Brookfield
To discharge to the Still River
Watershed an average daily flow
of 14,400 gallons per day of
treated domestic sewage. Condi-
tions.

1/9/81: Connecticut Treatment
Corporation, Bristol
To discharge to the City of
Bristol sewerage system a maxi-
mum daily flow of 50,000 gallons
per day of treated metals, oil
and organic bearing wastewaters.
Conditions.

1/9/81: Connecticut Treatment
Corporation, Bristol
To discharge non-contact cooling
water to the Eight Mile River at
a maximum daily flow of 45,000
gallons per day and a maximum dai-
ly temperature of 100° F. Condi-
tions.

1/16/81: Town of Southington
To discharge to the Quinnipiac
River an average daily flow, prior

to June 20, 1983, of 2,000,000
gallons per day of wastewaters,
and after June 20, 1983, an aver-
age daily flow of 7,800,000 gal-
lons per day of wastewaters.
Conditions.

1/16/81: City of Meriden
To discharge to the Quinnipiac
River, before the installation of
advanced wastewater treatment
facilities, an average daily flow
of 7,500,000 gallons per day of
wastewaters, and after the com-
pletion of advanced wastewater
treatment facilities, an average
daily flow of 11,600,000 gallons
per day of wastewaters. Condi-
tions.

1/16/81: Town of Wallingford
To discharge to the Quinnipiac
River, prior to the installation
of advanced wastewater treatment
facilities, an average daily flow
of 5,000,000 gallons per day of
wastewaters, and after the com-
pletion of advanced wastewater
treatment facilities, an average
daily flow of 7,500,000 gallons
per day of wastewaters. Condi-
tions.

DEP Citizens' Bulletin

State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

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